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EXAMINER	
SRIVASTAVA, KAILASH C	
ART UNIT	**PAPER NUMBER**
1657	
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12/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/614,448	SHIMP, LAWRENCE A.	
	Examiner	Art Unit	
	Dr. Kailash C. Srivastava	1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29,31-64 and 66-88* is/are pending in the application.

4a) Of the above claim(s) *2-29,31,36-51,53-63 and 66-88* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 32-35, 52 and 64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Request for continued examination (i.e., R.C.E.) under 37 C.F.R. §1.114, including the fee set forth in 37 C.F.R. §1.17(e), was filed in this application on 26 September 2007 after a Final action mailed 27 July 2007. Since this application is eligible for continued examination under 37 C.F.R. §1.114, and the fee set forth in 37 C.F.R. §1.17(e) has been timely paid, the finality of the previous Office action mailed 23 March 2007 has been withdrawn pursuant to 37 C.F.R. §1.114. Amendment filed 23 July 2007 has been entered. Accordingly an R.C.E. has been established and the action on R.C.E. follows.

2. Response and amendments filed 26 September 2007 are acknowledged and entered.

Withdrawal of Rejections based on Applicant's Amendments

3. In view of remarks and amendments filed 26 September 2007, the Obviousness rejection to Claims 1, 30, 32-35, 52 and 64-65 are rejected under 35 U.S.C. § 103 (a) as obvious over the combined teachings from Sierra et al. (WO 98/31403) in view of Peterson (U.S. Patent 5, 730,933) and further in view of Higgins (U.S. Patent 5,753, 182).

General Matters

4. Please note for record, in the response filed 26 September 2007, the following issues raised in the Office Action mailed 27 July 2007 have not been addressed:

- At item 3 of the Office Action mailed 27 July 2007-The correct date of mailing of a previous Office Action (actually mailed on 11 August 2006) rather than on 11 August 2005 , or 11 September 2006, as mentioned in the response filed 11 December 2006;
- Items 13 and 14 at Page 3 of the Office action of 07/27/2007 regarding objection of Claim 1, rather than of Claims 30, 32-35, 52 and 64-65 in Office Action mailed 11 August 2006; and
- Confusion between objection and rejection as mentioned at item 15.

To expedite the prosecution of instant application, however, the present Office Action addresses applicants' amendments and response in the Response filed 26 September 2007. In response to this Office Action, the above-mentioned issues raised in the Office Action mailed 27 July 2007 and not addresses in the response files 26 September 2007 should be addressed for the transparency of the record.

Claims Status

5. Claims 30 and 65 have been cancelled.

6. Claims 32-35, 52 and 64 have currently been amended.

7. Claims 1-29, 31-64 and 66-88 are pending.

8. Claims 2-29, 31, 36-51, 53-63 and 66-88 remain withdrawn.

9. Claims 1, 32-35, 52 and 64 are examined on merits.

10. Please note, the presentation of current set of claims accompanying response filed 26 September 2007 to Office Action mailed 27 July 2007 is not in accordance with the Rules effective July 2003 (See M.P.E.P., 714 [R-5]. IIC (A) Amendments) because Claim 30 despite being cancelled has been completely written. According to new regulations on claim presentation, the cancelled claim should be written as e.g., Claim 65 has been presented in the Claim listing accompanying Response filed 26 September 2007.

Not withstanding the foregoing non-compliance to claim rules, and to furthering the prosecution of instant application, a detailed Office Action follows. Please present the current status of cancelled claims according to the M.P.E.P., rule cited *supra* in response to instant Office action.

Claim Rejections - 35 U.S.C. § 112

First Paragraph, Lack of Written Description

11. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> ***The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.***

12. Claims 1, 32-35, 52 and 64 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

The M.P.E.P. states that the purpose of the written description requirement is to ensure that the inventor had possession; at the time the invention was made, of the specific subject matter claimed. The courts have stated:

"To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude, "the inventor invented the claimed invention." *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997); *In re Gostelli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) ("[T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." Lockwood, 107 F.3d at 1572, 41 USPQ2d at 1966." *Regents of the University of California v. Eli Lilly & Co.*, 43 USPQ2d 1398.

Further, for a broad generic claim, the specification must provide adequate written description to identify the genus of the claim. *In* Regents of the University of California v. Eli Lilly & Co. the court stated:

> "A written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." Fiers, 984 F.2d at 1171, 25 USPQ2d 1601; *In re Smythe*, 480 F.2d 1376, 1383, 178 USPQ 279, 284985 (CCPA 1973) ("In other cases, particularly but not necessarily, chemical cases, where there is unpredictability in performance of certain species or sub-combinations other than those specifically enumerated, one skilled in the art may be found not to have been placed in possession of a genus...") *Regents of the University of California v. Eli Lilly & Co.*, 43 USPQ2d 1398.

M.P.E.P. §2163 further states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." M.P.E.P. §2163 does state that for a generic claim the genus can be adequately described if the disclosure presents a sufficient number of representative species that encompass the genus. If the genus has a substantial variance, the disclosure must describe a sufficient variety of species to reflect the variation within that genus. See M.P.E.P. § 2163. Although the M.P.E.P. does not define what constitutes a sufficient number of representative species, the courts have indicated what does not constitute a representative number of species to adequately describe a broad generic. In Gostelli, the courts determined that the disclosure of two chemical compounds within a subgenus did not describe that subgenus. *In re Gostelli*, 872, F.2d at 1012, 10 USPQ2d at 1618.

The factors considered in the Written Description requirement are:(1) level of skill and knowledge in the art, (2) partial structure, (3) physical and/or chemical properties, (4) functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the (5) method of making the claimed invention. Disclosure of any combination of such identifying characteristics that distinguish the claimed invention from other materials and would lead one of skill in the art to the conclusion that the applicant was in possession of the claimed species is sufficient." (M.P.E.P. §2163).

In the instant case, the claims are drawn to a method to sterilize a biological material in presence of a "protective atmosphere" comprised of an "inert", or a mixture of an "inert" and a reducing atmosphere, wherein said sterilizing method is to reduce and/or inactivate an adventitious agent or adventitious agents. In said method, the inert atmosphere is comprised of at least one inert gas selected from the group consisting of nitrogen and argon and the reducing atmosphere is comprised of at least one reducing gas among: hydrogen, hydrogen sulfide and carbon monoxide. The biological material in said method is a bone, food, therapeutically useful device, therapeutically useful substance and a tissue.

The claimed invention is assessed as follows with regard to the written description factors listed *supra*.

A. *Level of skill and knowledge in the art:*

At least a Bachelor Degree in Biochemical engineering, Biochemistry, Biology, Biomedical engineering, Biophysics, Chemical engineering, Chemistry, Cytology, Environmental engineering, Environmental Science and Technology, Histology, Material science and engineering, Microbiology, Molecular biology, Pharmaceutical Sciences, or Pharmacology.

B. *Partial structure:*

The structure of the claimed invention does not fit the description presented in currently written description because at Pages 1-25 of the specification as currently presented, there is no clear evidence/data showing reduction and/or inactivation of an adventitious agent or adventitious agents. Note that in the specification as currently presented, the description for adventitious agents is "such as microorganisms, particularly pathogenic material and viral microorganisms and polynucleotide fragments thereof present upon and/ or within the biological material" (See, Specifiation, Page 6, Lines 15-17).

C. *Physical and/or chemical properties:*

The physical and chemical aspects for reduction and/or inactivation of an adventitious agent or adventitious agents is not of record in the specification. If such a showing exists in the specification as currently presented, it should be clearly made of record.

D. *Functional characteristics:*

The structure-function relationships of sterilizing a biological material as a biological material is defined in the specification and reduction and/or inactivation of an adventitious agent

or adventitious agents has not been elaborated in the specification as currently presented. Furthermore, "a therapeutically useful device" is not an art-recognized "biological material". Thus, the definition of "biological materials" as presented in currently described specification is not consistent with art-recognized terminologies/definition.

E. *Method of making the claimed invention:*

As pointed out *supra*, in items b-d the description as currently presented does not give detailed information regarding reduction and/or inactivation of an adventitious agent or adventitious agents acceding to claimed method. The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See *In re Wilder*, 736, F.2d 1516, 1521, 222 USPQ 369, 372-73 (Fed. Cir. 1984). Accordingly, it is deemed that the specification fails to provide adequate written description for the claims.

The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See *In re Wilder*, 736, F.2d 1516, 1521, 222 USPQ 369, 372-73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin [e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate.") Accordingly, it is deemed that the specification fails to provide adequate written description for the claims because Claim 1 is the generic claim, and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

35 U.S.C. § 112, first Paragraph, Lack of Scope

13. Claims 1, 32-35, 52 and 64 are rejected under 35 U.S.C. §112, first paragraph, because the specification, while being enabling for a method to sterilize a biological material in presence of a "protective atmosphere" comprised of an "inert", or a mixture of an "inert" and a reducing atmosphere does not provide evidence for a sterilizing method with the steps described *supra* to" reduce and/or inactivate an adventitious agent or adventitious agents". Thus, the specification as currently presented, does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with said claims.

The Claims are drawn to a method to sterilize a biological material in presence of a "protective atmosphere" comprised of an "inert", or a mixture of an "inert" and a reducing atmosphere, wherein the inert atmosphere is comprised of at least one inert gas selected from the group consisting of nitrogen and argon and the reducing atmosphere is comprised of at least one reducing gas among: hydrogen, hydrogen

sulfide and carbon monoxide and the method is to " reduce and/or inactivate an adventitious agent or adventitious agents". In the currently given description in the specification, the adventitious agents is "such as microorganisms, particularly pathogenic material and viral microorganisms and polynucleotide fragments thereof present upon and/ or within the biological material" (See, Specification, Page 6, Lines 15-17).

From the record of the present written disclosure, the scope of the claimed invention recited in Claims 1, 32-35, 52 and 64 is not supported by the specification on record because in said specification there is evidence that the claimed adventitious agents were actually reduced or inactivated. The evidence only shows that the claimed biological materials were subjected to gamma ray radiation in presence of the claimed gaseous atmosphere (s) and the mechanical properties were sustained in presence of said gases.

A person of skill would not be able to practice the invention because undue experimentation will be required to obtain a "a method to sterilize a biological material in presence of a "protective atmosphere" comprised of an "inert", or a mixture of an "inert" and a reducing atmosphere, wherein said sterilizing method is to reduce and/or inactivate an adventitious agent or adventitious agents. In said method, the inert atmosphere is comprised of at least one inert gas selected from the group consisting of nitrogen and argon and the reducing atmosphere is comprised of at least one reducing gas among: hydrogen, hydrogen sulfide and carbon monoxide. The biological material in said method is a bone, food, therapeutically useful device, therapeutically useful substance and a tissue.

Undue experimentation will be required due to the quantity of experimentation necessary; limited amount of guidance and limited number of working examples in the specification; nature of the invention; state of the prior art; relative skill level of those in the art; predictability or unpredictability in the art; and breadth of the claims. (In *re Wands*, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988) as illustrated below.

I. *Quantity of Necessary Experimentation*

The specification does not provide any evidence on a method to reduce and/or inactivate an adventitious agent or adventitious agents, because the current description of specification does not show any data post irradiation where a given microorganism's population/number or bioburden was reduced or a given microorganism present in certain quantity prior to claimed sterilization procedure was reduced in number or was found to be inactive post-sterilization of claimed "biological material".

II. *Limited Amount of Guidance*

The specification as currently presented does not provide a clear-cut guidance to obtain the

claimed invention method according to claimed steps because the present disclosure as described how the reduction in bioburden on the biological burden claimed to have been sterilized according to claimed method was actually assayed or assessed.

III. *Limited Number of Working Examples in the Specification*

The specification, as currently presented does not provide any specific evidence to practice the claimed invention, because it does not give data to demonstrate that "post sterilization" according to claimed sterilization method and steps of the claimed method; there actually was a reduction in the adventitious agents associated with the claimed biological materials or in the activity of adventitious agents associated with the biological materials. The reason is that the description given in the specification does not illustrate how claimed biological materials were evaluated for said parameter (i.e., numbers and activity of claimed adventitious agents) prior to, and post claimed sterilization method.

IV. *Nature of the Invention*

The currently presented specification does not delineate the claimed method with clear-cut data that the claimed adventitious agent or agents were actually reduced or inactivated according to the claimed sterilization method according to claimed steps.

V. *State of the Prior Art*

The prior art description in the specification is adequate regarding detecting any or every target living cell according to methods/description prevalent in the pertinent art.

VI. *Relative Skill Level of those in the Art*

At least a Bachelor Degree in Biochemical engineering, Biochemistry, Biology, Biomedical engineering, Biophysics, Chemical engineering, Chemistry, Cytology, Environmental engineering, Environmental Science and Technology, Histology, Material science and engineering, Microbiology, Molecular biology, Pharmaceutical Sciences, or Pharmacology.

VII. *Predictability or Unpredictability in the Art*

Unless supported with illustrative experimental evidence (i.e., data), biological responses/ phenomenon are unpredictable. Thus, information obtained under one set of detrimental parameters may not be extrapolated for another set of parameters/environmental or specific conditions.

VIII. *Breadth of the Claims*

As noted above in item a, the claimed invention has a number of parameters associated with the claimed method and upon sterilization of claimed biological materials according to claimed steps of the claimed invention, said invention method should be "effective to reduce and/or inactivate an adventitious agent or adventitious agents" from the claimed biological materials. In the absence of evidenced data, however, the specification as currently presented, does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with said claims

35 U.S.C. § 112, Second Paragraph Rejection

14. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> ***The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.***

15. Claims 1, 32-35, 52 and 64 are rejected under 35 U.S.C. §112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

- Claim 1 as recited presently seem to be incomplete because said claim does not elaborate each and every element of the step about accomplishing to have protected one or more property of a biological material as claimed in teh preamble of Claim 1. While there is no specific rule or statutory requirement that specifically addresses the need for a detailed step in claims in a process, it is clear from the record, and would be expected from conventional steps in a process as well as for clear and concise understanding of instant claim; that those steps/ sub-steps are defined. Thus, the claim fails to particularly point out and distinctly claim the "complete" process. The metes and bounds of the claimed process are therefore not clearly established or delineated.

- In Claim 1b are recited the limitations "package" (See, Claim 1b, Line 1), "packaged biological material" (See, Claim 1b, Line 2). There is insufficient antecedent basis for this limitation in claim 1b because the preamble for Claim 1 is drawn to a method to protect one or more properties of a biological material.

- In Claim 1c is recited the limitation, "packaged biological material" (See, Claim 1c, Line 1). There is insufficient antecedent basis for this limitation in claim 1c because the preamble for Claim 1 is drawn to a method to protect one or more properties of a biological material.

- Phrase, "inert atmosphere" in Claims 1, 32 and 34 and "inert gas" in Claim 32 render those claims incomprehensible, unclear and vague because the metes and bounds for the word "inert" art not delineated. Do said phrases mean "inactive", "non-reactive", "non-responsive", "indifferent to an object, or subject" or what?. The metes and bounds for the word, "inert" should be clearly defined.

- The phrase, "therapeutically useful device" as a part of Markush group consisting of a "biological material" in Claim 64 renders said claim incomprehensive, unclear, vague and therefore, indefinite. While applicant may be his or her own lexicographer, a term in a claim may not be given a meaning that is inconsistent with the art-recognized meaning of that term. See *In re Hill*, 161 F.2d 367, 73 USPQ 482 (CCPA 1947). It is not clear, how a "biological material" can be a "therapeutically useful device". Appropriate correction / explanation is required.

Appropriate corrections are required for limitations described in each of Claims 1, 32, 34 and 64 as explained *supra.*

All other claims depend directly or indirectly from the rejected claim (e.g., Claim 1) and are, therefore, also rejected under 35 U.S.C. §112, second paragraph for the reasons set forth above.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> ***A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.***

17. Claims 1, 32-35, 52 and 64 are rejected under 35 U.S.C. § 103 (a) as obvious over the combined teachings from Sierra et al. (WO 98/31403) in view of Schankereli (U.S. Patent 5, 782,914 A) and further in view of Bertiger (US Patent 4,538,757).

Claims recite a method to protect a property of a biological material during sterilization of said biological material via packaging said biological material under vacuum or in an "inert", or a mixture of inert and reducing atmosphere and subsequently sterilizing said package under said atmosphere to reduce or inactivate "adventitious agents". Claims further recite that the reducing atmosphere is comprised of one among hydrogen, hydrogen sulfide or carbon monoxide and inert atmosphere is comprised of nitrogen or argon, wherein the biological material is bone or tissue.

Sierra et al. teach a method, wherein a collagen based surgical tissue formulation as a tissue adhesive composition placed in an appropriate container (e.g., syringe or a frame) is first dried via lyophilization, freeze-drying or dried under vacuum (Page 8, Lines 2-5; Page 12, Lines 26-29 and Page 26, Lines 20-21) and subsequently radiation- sterilized with an electron beam (i.e., e-beam) or gamma radiation (Page 27, Lines 1-3; in a temperature range of 0° C to ambient (i.e., room temperature). During irradiation, the collagen-based material is kept cool (i.e., at temperature between –40°C to 10°C), while being exposed to e-beam irradiation at a dosage in range of 10-40 KGy (Page 14, Lines 3-13), or gamma radiation (Page 27, Lines 19-20). Note that Sierra et al., teach radiation sterilization of a biological material and therefore, intrinsically teach radiation sterilization of a bone, because bone is also a biological material/tissue. Sierra et al. do not teach that radiation sterilization discussed *supra* is conducted in presence of an inert gas (e.g., argon (Ar), helium (He) or nitrogen (N_2)) mixed with a reducing atmosphere. e.g., hydrogen (H_2), or in presence of a reducing atmosphere (e.g., hydrogen).

Schankererli teaches a method for radiation sterilization of a vacuum-dried tissue contained in a pouch and further teaches that evacuation and/ or replacement of the atmosphere within the tissue package using argon or nitrogen limits free radical formation (i.e., oxidation) of the tissue during radiation sterilization, thus inhibiting chemical and physical damage to the tissue (Column 3, Lines 57 to Column 4, Line 22). Said material is lyophilized, vacuum dehydrated or freeze-dried prior to irradiation. Bertiger teaches that a reducing atmosphere prevents oxide formation (i.e., oxidation) and teaches a method to do so in presence of an atmosphere comprising 85% nitrogen and 15% hydrogen (Column 1, Lines 6-7; Lines 45-59 and Column 2, Lines 18-57). Note that both Schankereli and Bertiger teach processes comprising exposure of material to be processed to an inert or a mixture of an inert and a reducing atmosphere to prevent damage to the material b being processed, wherein said damage is because of the potential oxidation of said material (i.e., tissue or a device) during the heat generating process (i.e., gamma sterilization, or soldering). Thus, in each case, it is the oxidation of material being processed that

is prevented which is the logic behind conducting said processes in presence of an inert or an inert mixed with a reducing atmosphere.

One having ordinary skill in the art at the time of the claimed invention would have been motivated to modify the teachings from Sierra et al., according to combined teachings from each of Schankereli and Bertiger; because as discussed in the previous paragraph, the cited prior art references teach a method to sterilize a biological material and additionally preventing the oxidation of said material(s) by conducting said processes in an inert or a mixture of an inert and a reducing atmosphere. Regardless of the material being treated, the logical reason to conduct the process is to prevent the damage to the material, which is also the objective of the instantly claimed method (i.e., to "protect one or more properties of the biological material).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made to combine the teachings from Sierra et al. according to the combined teachings from each of Schankereli and Bertiger to obtain a method to sterilize a biologically active material through gamma, or electron beam irradiation in an atmosphere of a mixture of nitrogen and hydrogen (i.e., mixture of an inert and a reducing atmosphere), wherein said biological material was packaged in an unsealed or sealed package, dried through lyophilization, or freeze-drying; and subsequently said packaged biological material kept in an inert atmosphere comprising either vacuum or inert gases or in an atmosphere of inert gases mixed with hydrogen, prior to said radiation; because, Sierra et al. teach a method , wherein a biologically active material placed in an appropriate container is dried via lyophilization, freeze-drying or dried under vacuum and subsequently radiation- sterilized with an electron beam (i.e., e-beam) or gamma radiation at a temperature in range of 0°C and ambient and each of Schankereli and Bertiger substantiate Sierra et al's teachings since each one of Schankereli and Bertiger teach preventing oxidation of the material being processed because of the interaction of heat produced during each of the gamma irradiation, or soldering). The prior at references discussed *supra* do not teach exactly same dimensions for each of the parameter for irradiation -mediated sterilization of a biologically active material. However, the adjustment of particular conventional working conditions (e.g., irradiation dosage, temperature during irradiation, means to dry the sample and type of inert gas atmosphere; torr of negative pressure for vacuum or exact same volume to volume mixture of inert and reducing gas, but do teach a vacuum and a certain percentage of nitrogen and hydrogen in the mixture of inert and reducing gaseous mixture) is deemed merely a matter of judicious selection and routine optimization of a result-effective parameter that is well within the purview of the skilled artisan. In view

of the fact that the applicant's invention also recites a method to sterilize a biologically active material and the basic principle of said method is to protect one or more properties of said material during the claimed process via prevention of oxidation of said material by conducting said process in an atmosphere comprising mixture of an inert and a reducing gas.

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Conclusion

18. For reasons aforementioned, no Claims are allowed.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Kailash C. Srivastava whose telephone number is (571) 272-0923. The examiner can normally be reached on Monday to Thursday from 7:30 A.M. to 6:00 P.M. (Eastern Standard or Daylight Savings Time).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Jon Weber can be reached at (571)-272-0925 Monday through Thursday 7:30 A.M. to 6:00 P.M. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding may be obtained from the Patent Application Information Retrieval (i.e., PAIR) system. Status information for the published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (i.e., EBC) at: (866)-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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